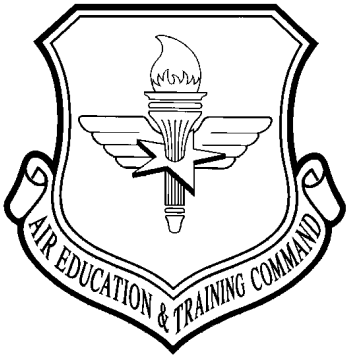
Flying Training

Navigator Introductory Flight Training

May 2003



Air Education and Training Command

DEPARTMENT OF THE AIR FORCE
Headquarters Air Education and Training Command
Randolph AFB TX 78150-4325

AETC Syllabus S-V8A-E

May 2003

This syllabus outlines the training required to successfully complete this program. It prescribes the course content, instructions to conduct the training, and the approximate time necessary to successfully complete all requirements. Any training not specifically authorized in this syllabus or other AETC directives is prohibited without prior approval of this headquarters. Forward suggestions to HQ AETC/DOFI, 1 F STREET STE 2, RANDOLPH AFB TX 78150-4325. The next planned revision is May 2005.

OFFICIAL

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Contents

Chapter 1

Course Description

Navigator Introductory Flight Training (NIFT) is a course designed to give USAF navigator training candidates the opportunity to experience flight prior to beginning Joint Specialized Undergraduate Navigator Training (JSUNT). The goal is to expose students to aviation and navigation concepts and increase their aviation situational awareness while providing elementary training in the desired USAF navigator skill set. The student should be exposed to analyzing navigation data, both visual and instrument, determining present position, estimating time of arrival, and corrections of heading to maintain course. Additionally, students should gain an understanding of all phases of flight so they can help ensure the safe and effective completion of the lesson, and better prepare them for follow-on JSUNT.

The course includes two elements: ground training and flight training. Ground training consists of a Federal Aviation Administration (FAA) ground training course, preferably taught in a formal classroom program prior to flight training. Students must pass the FAA Private Pilot Certificate (PPC) written knowledge test to complete this element of training. Students who fail the written knowledge test must retake it until a passing grade is attained. Test failure requires supervisor notification. Subsequent failure(s) may warrant consideration for elimination from NIFT.

Flight training consists of 13 lessons, 20 hours with ½-hour for briefing and ½-hour for debriefing. Conduct the lessons in a Single-Engine-Land (SEL) airplane with the student in the left seat for maximum access to the navigation and flight instruments. The completion standard for all training events is to observe a demonstration of the event by the certified flight instructor (CFI). However, encourage the student to perform the event if the CFI feels the student can safely accomplish it. The student should make all radio/communication calls (with CFI assistance only as needed.) NIFT training objectives are the primary focus of government-purchased flying time. Complete all prescribed lesson events except as described in the Incomplete Lessons section below.

Ground Training — Enter the student in a FAA-approved ground training program. If available, the student should attend a formal classroom program with FAA Knowledge Test prior to beginning flight training. Failure to pass the FAA written examination is cause for elimination from this program. However, students may be allowed to retake the examination until they pass. The majority of the concepts tested are transferable to JSUNT. Supervisors must be advised and involved in any instances of student failure.

Flight training — The training objectives are designed to expose the student to flight and are derived from portions of both PPC and Instrument Rating practical test standards. The student should monitor the parameters of the airplane, be situationally aware of the airplane's position, and understand pilotage and dead reckoning to fly a predetermined flight profile. The syllabus is organized in three stages, each providing an important segment of the student's training. Each lesson builds upon previous learning and therefore, should be completed in sequence. Only Lesson 9, the night familiarization lesson, may be flown out of sequence to adapt to the training environment (instructor, student and airplane availability, etc.). However the night familiarization flight should be complete before any other night activities. One cross-country flight in Stage 3 is recommended as a day-night out-and-back, if available. Additionally, one of the cross-country flights should be to a field with an operating Flight Service Station (FSS) with a tour of the FSS facility conducted (at no additional expense to the government). Supervisors must be advised and involved in any instances of student failure to perform or progress.

Stage 1 — The orientation stage consists of Lessons 1 – 3. These 3 flights are designed to introduce flight preparation, airplane documents, preflight and postflight inspections, checklist use, systems operation, radio communications, basic maneuvers, emergency equipment, and airport procedures. The goal is to expose the student to the dynamics of flight and the processes required to safely fly in the civil aviation community. This stage lays the foundation for the rest of the program.

Stage 2 — The instrument stage consists of Lessons 4 – 8. These 5 lessons are designed to introduce the proper use of navigation equipment in the airplane, the National Airspace System, and the proper use of charts, Airport Facility Directory and Instrument Approach Procedures book. Additionally, these lessons continue to focus on and develop student radio communication skills. The cross-country part of this phase (Lesson 8) introduces the student to cross-country navigation and strange field operations. Additionally, Lesson 8 may provide instrument approach training if the home field is not so equipped.

Stage 3 — The navigation stage is the culmination of the student's training and encompasses Lessons 9 – 13. In this stage the student is introduced to pilotage and dead reckoning used for accurate visual navigation while calculating Estimated Time of Arrival (ETA). Additionally the student is introduced to night operations prior to flying the navigation sorties. The first lesson (Lesson 9) introduces the student to the peculiarities of night operations. Lesson 9 may be flown out of sequence in this stage, but must be accomplished prior to Lesson 12. The next two lessons in this stage (10 and 11) introduce the concepts of visual position fixing, drift control and wind effects on groundspeed. The last two lessons (12 and 13) combine all of the concepts taught in the program. The flight profile includes a three-segment visual navigation route toward an airport other than the departure airport. The profile continues with an instrument approach (if available) at the outlying airport, departing on an instrument departure (if available) to intercept a Victor Airway planned route (if available) back to the departure airport for a normal approach and landing. By this stage of training, the student should have developed strong radio communication skills and should require minimum CFI assistance.

Recommended Sequence

1. Preflight Discussion
2. Flight
3. Postflight Discussion

Preflight Discussion — Prior to each flight, the instructor must provide the student with an overview of the subject matter to be covered during the lesson. The instructor should select a quiet, private place to brief the student and explain the lesson subject matter. It is important the instructor defines unfamiliar terms and explains the maneuvers and objectives of each lesson, since proper preparation of the student ensures progress during the lesson. Significant time is required for flight planning during Stage 3 lessons. The student is required to arrive for the preflight discussion with flight planning complete. This syllabus allots one-half hour for preflight briefings.

Flight — Airplane practice must be conducted so the student obtains the maximum benefit from each flight. Each lesson should begin with a review of previously learned concepts as they apply to new concepts being introduced. Annotate the items accomplished and the level of participation by the student (D or P) on the students NIFT Gradesheet. During the flight, the student participation levels are defined as follows:

1. *Demonstrate* — The CFI demonstrates the maneuver or lesson topic with appropriate verbal instruction.
2. *Perform* — The student accomplishes the required actions with CFI instruction.

Chapter 4 — Training Lessons outline the actions required during the lessons to achieve the learning objectives. These lists are *not* all-inclusive and may not cover every action necessary for all flying training situations. For example, some flight schools may operate at an airport requiring flight plan actions on every flight versus only IFR flight.

For Lessons 5 – 8, 12 and 13 an instrument flight plan should be used. Although visual meteorological conditions (VMC) are acceptable for all flights, Lessons 5 – 8 may be flown in instrument meteorological conditions (IMC) if necessary. All other flights may be flown in combination IMC/VMC as long as those activities requiring VMC can be completed. For example, on sortie 12, if the visual navigation route is VMC, but the planned route and altitude for the return leg is IMC, the flight can still be accomplished.

Postflight Discussion — The postflight discussion is equally as important as the preflight orientation. During each postflight session, thoroughly debrief the student. A well-constructed debriefing is a valuable instructional technique because it increases retention and, to some degree, prepares the student for the next lesson. This syllabus allots one-half hour for postflight briefings.

Incomplete Lessons — Make every attempt to complete all lesson events in the allotted amount of flight time. Lesson events that cannot be completed in a lesson should be covered in the next available lesson to the greatest extent possible as long as there is no increase in total flight time. Circumstances beyond the CFI's control may require events to be omitted because of time constraints. In this case, the precedence of events is to complete (in decreasing precedence) NAVAID orientation and tracking, visual pilotage and dead reckoning, Victor Airway operations, approaches, all other items.

Chapter 2

Course Administration

1. Syllabus Interpretation — This syllabus is directive and must be followed as written. If no clear syllabus guidance exists, contact the OPR, HQ AETC/DOFI, at DSN 487-6341, Commercial (210) 652-6341.

2. Duration — The entire NIFT program should be completed within 45 calendar days. The program should be completed no later than 15 days prior to beginning Joint Specialized Undergraduate Navigator Training. There are no provisions for warm-up flights based on time between completion and start of JSUNT.

3. Course Entry Prerequisites — USAF/Air Force Reserve (AFRC)/Air National Guard (ANG)-identified navigator training candidate. Students with FAA certified private pilot certificate (or higher) or formerly rated military pilots are not entered into this program.

4. Status Upon Graduation — Commissioned officer graduates of this course enter into USAF JSUNT. Officer trainee graduates enter into JSUNT upon graduation from the Officer Basic Military Training Pre-commissioning Course. AFROTC, ANG and AFRES navigator candidates who successfully complete this program qualify to enter JSUNT upon successful completion of commissioning requirements. USAFA navigator candidates enter navigator training after graduation from the USAFA.

5. Ground Training

a. FAA Ground School and Examination — Use the flight school's advertised ground school program as long as the student can complete within the program's 45 calendar-day time limit. If able, the preferred method is a formal classroom course. However, ground school can be conducted in any FAA approved format, home study, one-on-one instruction etc., as available and at the CFI's discretion.

b. Lesson Briefing and Debriefing 13.0 hours

6. Device/Flying Training — The times specified are actual lesson times and do not include time for briefing or debriefing.

Single-Engine Land Airplane		***Lessons/Approx Hours***	
Stage 1 — Orientation		3/3.0	(Dual)
Stage 2 — Instruments		5/6.4	(Dual)
Stage 3 — Navigation		5/10.6	(Dual)
	Total	13/20.0	

7. Training Requirements and Restrictions

a. *Average Hours/Events* — This syllabus permits the student to complete the course objectives in 20.0 flying hours. The flying hours reflect an estimate of the flight time required to complete the prescribed profiles. There may be slight differences in flight time requirements because of airspace or other physical considerations. However, every effort must be made to complete the sortie profiles in the allotted times.

b. *Maximum Hours* — A maximum of 20.0 flying hours is authorized for introductory flight training except in unusual circumstances. Anytime it becomes apparent a student may exceed 20.0 hours, the CFI or designated representative of the FBO/Flight Training Center must obtain approval from the student's supervisor prior to exceeding the allotted time. The student's supervisor must use AETC Form 6 approved through HQ 19AF or USAFA/34 OG to 19 AF/DO for the extra time. 19 AF/DO must act expeditiously on these requests because they may affect UFT class assignments. Student supervisors must actively follow-up to ensure no training opportunity is lost.

c. Lesson Lengths — Lessons and approximate flying hours are listed below. Adhere to the approximate time per lesson as closely as possible for the average student. For each lesson, one additional hour is allotted for briefing and debriefing combined.

Lesson	*Flight Time*	*Briefing & Debriefing*	*Total Time*
1	1.0	1.0	2.0
2	1.0	1.0	2.0
3	1.0	1.0	2.0
4	1.0	1.0	2.0
5	1.2	1.0	2.2
6	1.2	1.0	2.2
7	1.5	1.0	2.5
8	1.5	1.0	2.5
9	2.0	1.0	3.0
10	1.8	1.0	2.8
11	1.8	1.0	2.8
12	2.5	1.0	3.5
13	2.5	1.0	3.5
Total	20.0	13.0	33.0

d. *Maximum Daily Student Flying Activities* — Students may not exceed two lessons per day except to complete an incomplete lesson.

e. *Extracurricular Flying* — NIFT students are encouraged to participate in additional flying training (e.g. FAA private pilot training) at no expense to the government. NIFT training objectives are the primary focus of government purchased flying time. However, since many NIFT training objectives are transferable to obtaining FAA private pilot certification, students are encouraged to use this opportunity to further their flight training at their own expense.

8. Syllabus Distribution — HQ 19AF and USAFA provide this syllabus electronically or by hard copy for instructors and students participating in NIFT.

9. Drop On Request (DOR) — Students can remove themselves from training by dropping on request. When students DOR, refer them to their supervisor. Supervisors must counsel the student on the implications of DOR and future flight training. Normally, students who elect to DOR are not eligible for acceptance into any other USAF course of flying training (UPT, UNT, ABM) at a later date. Supervisors will remove the student from the NIFT program and notify the HQ 19AF or USAFA program manager via AETC Form 126A for appropriate action (refer to AETCI 36-2205).

Chapter 3

Training Documentation

1. Task Accomplishment — Document task accomplishment on the NIFT Gradesheet, AETC Form 33, using the following grades:

a. **Demonstrated** (**D**) — Enter D on the record of training when the CFI demonstrates the maneuver.

b. **Performed (P)** — Enter P on the record of training if the student accomplishes the operation, maneuver or task normally at the aircraft controls with instructor input.

Students ensure the NIFT gradesheet, AETC Form 33, is provided to and completely filled out by the CFI. This gradesheet is the documentary evidence of training/lesson completion. Gradesheets can be obtained from HQ 19 AF, Randolph AFB, TX or 34 OG, USAF Academy, CO. Once complete, provide gradesheets to 19 AF or USAFA (as appropriate) NIFT administrator. 19 AF and USAFA administrators maintain the gradesheets for historical data reference. Maintain and dispose of according to AFMAN 37-139, *Records Disposition Schedule.*

2. Course Training Standards — All tasks are required to be demonstrated (D) as a minimum to complete this program. Refer to FAA Private Pilot Practical Test Standards (FAA-S-8081-14) and FAA Instrument Rating Practical Test Standards (FAA-S-8081-4C) for description of individual tasks and objectives.

3. Duties and Responsibilities — The student accomplishes the following:

a. Participate in planning the lesson.

b. Ensure the airplane is inspected, preflighted, and serviced to perform the assigned lesson.

c. Operate as a crewmember/pilot to perform using sound judgment and situational awareness.

d. Assist with radio/communication transmissions.

Chapter 4

Training Lessons

Stage 1 — Orientation

Lesson 1

Dual — Local (1.0)

Objective — Introduce the student to the training airplane and airplane systems. The student learns how to conduct the necessary preflight and postflight activities, and is introduced to proper checklist procedures and normal flight maneuvers.

Preflight Discussion

Lesson Introduction

__ Certificates and Documents
__ Airplane Logbooks
__ Flight Planning (VFR)
__ Checklist Use
__ Preflight inspection
__ Systems Operation
__ Radio Communications
__ Equipment Checks
__ Location of Emergency Equipment
__ Collision Avoidance

Flight

__ Engine Start
__ Radio Communications
__ Taxiing Procedures
__ Before Takeoff Check
__ Normal Takeoff and Climb
__ Straight-and-Level Flight (VR)
__ Climbs, Descents, and Level-offs (VR)
__ Use and Effects of Control/Trim
__ Constant Angle Banked Turns (VR)
__ Visual Traffic Pattern
__ Normal Approach and Landing (VR)
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with the training airplane and its systems, and understands the necessity of proper checklist procedures. The student should be able to perform a preflight inspection of the training aircraft with CFI assistance. Additionally, the student should be familiar with straight-and-level flight, climbs, descents, turning flight using visual references, and the flight control inputs to produce these normal flight maneuvers.

Additional Guidance — Accomplish this lesson similar to a private pilot training student's first flight in the training aircraft. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 1 — Orientation

Lesson 2

Dual — Local (1.0)

Objective — Introduce the student to instrument references and normal flight.

Preflight Discussion

Lesson Review

__ Certificates and Documents
__ Airplane Logbooks
__ Flight Planning (VFR)
__ Checklist Use
__ Preflight Inspection
__ Systems Operation
__ Radio Communications
__ Equipment Checks
__ Location of Emergency Equipment
__ Collision Avoidance

Lesson Introduction

__ Takeoff Aborts
__ Go-Around Procedures
__ Crosswind Approach and Landing
__ V-Speeds
__ Basic Instrument Maneuvers
__ Wind shear and Wake Turbulence Avoidance Procedures

Flight

__ Engine Start
__ Radio Communications
__ Taxi Procedures
__ Before Takeoff Check
__ Normal Takeoff and Climb
__ Go-Around Procedures
__ Use/Effect of Controls and Trim
__ Constant Bank-Angle Turns (VR)
__ Straight-and-Level Flight (IR)
__ Constant Airspeed Climbs and Descents (IR)
__ Turns to Heading
__ Visual Traffic Patterns
__ Normal Approach and Landing
__ Crosswind Approach & Landing
__ Full Flap/No Flap Takeoff and Landing
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student should be familiar with straight-and-level flight, climbs, descents, and turning flight using instrument references and the flight control inputs to produce these normal flight maneuvers.

Additional Guidance — Accomplish this lesson similar to Lesson 1. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 1 — Orientation

Lesson 3

Dual — Local (1.0)

Objective — Introduce the student to unusual attitudes and emergency situations.

Preflight Discussion

Lesson Review

__ Certificates and Documents
__ Airplane Logbooks
__ Flight Planning (VFR)
__ Checklist Use
__ Preflight Inspection
__ Systems Operation
__ Radio Communications
__ Equipment Checks
__ Location of Emergency Equipment
__ Collision Avoidance

Lesson Introduction

__ Minimum Equipment List
__ Systems and Equipment Malfunctions
__ Emergency Procedures
__ Characteristics of Stalls and Recovery
__ Characteristics of Spins and Recovery

Flight

__ Engine Start
__ Radio Communications
__ Taxiing Procedures
__ Before Takeoff Check
__ Normal Takeoff and Climb
__ Constant Bank-Angle Turns
__ Slow Flight/Approach to Stall
__ Power-Off Stalls
__ Power-On Stalls
__ Cross-Control Stall
__ Turns to Heading (VR/IR)
__ Visual Traffic Pattern
__ Normal Approach and Landing
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with unusual attitudes and proper actions to deal with emergencies and equipment malfunctions.

Additional Guidance — This local area flight should introduce unusual attitudes leading to stalls and the results of a stalled aircraft. Provide a good discussion of system malfunctions and proper ways to deal with distractions in flight. Demonstrate, to the CFI's comfort level, the cues to identify an aircraft approaching stalled condition, in a stalled condition, and the proper procedures to recover from that condition. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 2 — Instruments

Lesson 4

Dual — Local (1.2)

Objective — Introduce the student to flight instruments and navigation aids available in the airplane.

Preflight Discussion

Lesson Review

__ Certificates and Documents
__ Airplane Logbooks
__ Checklist Use
__ Flight Planning (VFR)
__ Fuel Planning Considerations
__ Preflight inspection
__ Systems Operation
__ Additional Radio Communications required for IFR Clearance and Flight
__ Equipment Checks

Lesson Introduction

__ Sectional Charts
__ Airport and Runway Markings and Lighting
__ Visual Traffic Pattern
__ Airplane Flight Instruments
__ NAVAID Use — ADF, VOR, VOR/DME, GPS (as equipped)
__ Compass Use

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Takeoff and Climb
__ Radio Communications
__ Straight-and-Level Flight (VR/IR)
__ Climbs, Descents, and Level-offs (VR/IR)
__ NAVAID Orientation and Tracking (ADF, VOR, VOR/DME as equipped)
__ Traffic Patterns (VR)
__ Normal Approach and Landing
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with the proper use of flight instruments and navigation aids available in the airplane.

Additional Guidance — This local lesson emphasizes VOR Orientation and Tracking to prepare for proper navigation on Victor Airways. Accomplish as much NAVAID practice as possible, demonstrating proper use and interpretation of varying situations. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 2 — Instruments

Lesson 5

Dual — Local (1.2)

Objective — The student practices the use of navigation aids available in the airplane.

Preflight Discussion

Lesson Review

__ Sectional Charts
__ Airport and Runway Markings and Lighting
__ Visual Traffic Pattern
__ Airplane Flight Instruments
__ NAVAID Use — ADF, VOR, VOR/DME, GPS (as equipped)
__ Compass Use
__ Fuel Planning Considerations
__ VFR/IFR Radio Communications

Lesson Introduction

__ Flight Planning IFR

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Takeoff and Climb
__ Radio Communications
__ NAVAID Orientation and Tracking (ADF, VOR, VOR/DME as equipped)
__ Traffic Patterns (VR)
__ Visual Traffic Pattern
__ Normal Approach and Landing
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with the proper use of navigation aids available in the airplane.

Additional Guidance — Accomplish this lesson similar to Lesson 4. Continue the NAVAID Orientation and Tracking. Introduce other NAVAIDs as available and based on the student's ability. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 2 — Instruments

Lesson 6

Dual — Local (1.5)

Objective — Introduce the student to instrument approaches, National Airspace System and flight publications.

Preflight Discussion

Lesson Review

__ Airplane Flight Instruments
__ Compass Use
__ Flight Planning (IFR)
__ Fuel Planning Considerations
__ VFR/IFR Radio Communications
__ NAVAID Use — VOR, VOR/DME, GPS (as equipped)

Lesson Introduction

__ ATC Light Signals
__ National Airspace System (controlled and uncontrolled airspace)
__ Flight Publications (Airport Facilities Directory, Instrument Approach Book)
__ Controlled Airports
__ Weather Information Sources
__ Instrument Approaches (VOR, VOR/DME, ILS, GPS, as equipped)

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Takeoff and Climb
__ Radio Communications
__ Instrument Approaches (VOR, VOR/DME, ILS, GPS)
__ Use of ATIS/ASOS/AWOS
__ Use of Approach and Departure Control
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with instrument approach procedures. Additionally, the student gains familiarity with flight publications.

Additional Guidance — This lesson is designed to expose the student to instrument approaches. The student should be able to determine the prescribed flight path courses and altitudes on an instrument approach plate. Fly as many instrument approach procedures from the Initial Approach Fix to the Missed Approach Point or landing as practical. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 2 — Instruments

Lesson 7

Dual — Local (1.5)

Lesson Objective — Introduce the student to instrument departures and review instrument approach procedures.

Preflight Discussion

Lesson Review

__ ATC Light Signals
__ National Airspace System (controlled and uncontrolled airspace)
__ Flight Publications (Airport Facilities Directory, Instrument Approach Book)
__ Controlled Airports
__ Flight Planning (IFR)
__ Fuel Planning Considerations
__ VFR/IFR Radio Communications
__ Weather Information Sources
__ Instrument Approaches (VOR, VOR/DME, ILS, GPS as equipped)

Lesson Introduction

__ Instrument Departures (VOR, VOR/DME, ILS, GPS as equipped)

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Takeoff and Climb
__ Instrument Departure (VOR, VOR/DME, ILS, GPS as equipped and available)
__ Radio Communications
__ Instrument Approaches (VOR, VOR/DME, ILS, GPS as equipped)
__ Use of ATIS/ASOS/AWOS
__ Use of Approach and Departure Control
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with instrument departure procedures.

Additional Guidance — This lesson exposes the student to instrument departure procedures. Fly to multiple airports and shoot an instrument approach followed by the departure procedure. If there are no instrument departures within a practical distance, extra attention should be placed on this training objective on the ground during briefing/debriefing. Complete the lesson with multiple instrument approaches as a review of Lesson 7. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 2 — Instruments

Lesson 8

Dual — Cross-Country (2.0)

Objective — Introduce the student to instrument navigation on a cross-country flight. Exposed the student to planning and conducting an instrument navigation flight using federal airways to an airport greater than 50 NM from the departure airport.

Preflight Discussion

Lesson Review

__ Airplane Flight Instruments
__ Compass Use
__ NAVAID Use — VOR, VOR/DME, GPS (as equipped)
__ National Airspace System
__ Flight Planning (IFR)
__ Fuel Planning
__ VFR/IFR Radio Communications
__ NAVAID Use for Instrument Approaches (VOR, VOR/DME, ILS, GPS)

Lesson Introduction

__ Route selection
__ Victor Airway Navigation
__ Performance and Limitations
__ Navigation Log
__ Cockpit Management
__ Aeromedical Factors

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Normal Takeoff and Climb
__ Radio Communications
__ Opening Flight Plan
__ Instrument Departure (if available)
__ Flight on Federal Airways
__ Course Interception (Victor Route if available)
__ VOR Navigation
__ Estimates of Groundspeed and ETA
__ Position Fix by Navigation Facilities
__ At Least One Instrument Approach to an Airport Greater Than 50 NM from Departure Airport
__ Normal Approach (IFR if available) at Departure Airport
__ Landing
__ After Landing Procedures
__ Closing Flight Plan
__ Parking and Securing

Completion Standards — The student is familiar with cross-country navigation and flight on Federal Airways.

Additional Guidance — Utilize Victor Airways to the greatest extent possible for the enroute navigation portions of this flight. Where Victor Airways are unavailable, predetermine a navigation aid course (e.g., VOR radial) to track enroute. Encourage maximum use of navigation instruments as the situational awareness builder for this flight. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 3 — Navigation

Lesson 9

Dual — Local Night (1.0)

Objective — Introduce the student to night flying operations. The student learns how to conduct the necessary preflight and postflight activities and be introduced to aeromedical factors and flight planning considerations for night operations.

Preflight Discussion

Lesson Review

__ Certificates and Documents
__ Airplane Logbooks
__ Flight Planning (VFR)
__ Checklist Use
__ Preflight Inspection
__ Systems Operation
__ Radio Communications
__ Equipment Checks
__ Location of Emergency Equipment
__ Collision Avoidance

Lesson Introduction

__ Aeromedical Factors
__ Night Vision
__ Disorientation
__ Visual Illusions
__ Night Scanning/Collision Avoidance
__ Night Navigation and Orientation
__ Airplane, Airport, and Obstruction Lighting
__ Flight Planning Considerations
__ Fuel Requirements
__ Personal Equipment

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Takeoff and Climb
__ Radio Communications
__ Collision Avoidance
__ Straight-and-Level Flight (VR/IR)
__ Climbs, Descents, and Level-offs (VR/IR)
__ Night Navigation and Orientation
__ Visual Traffic Pattern
__ Normal Approach and Landing
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with night flying operations.

Additional Guidance — Ensure this lesson is accomplished at a time the student can see the differences in visual references at night. Limit the time in the traffic pattern to no more than two landings so as to maximize the Night Navigation and Orientation objective. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 3 — Navigation

Lesson 10

Dual — Local (1.8)

Objective — Introduce the student to the wind triangle (winds aloft, drift and course control). The student practices visual pilotage and dead reckoning through a predetermined visual navigation route.

Preflight Discussion

Lesson Review

__ National Airspace System (minimum flight altitudes)
__ Sectional Charts
__ Route selection
__ Flight Planning
__ Fuel Requirements
__ Performance and Limitations
__ Navigation Log

Lesson Introduction

__ Visual Navigation Route Selection
  — Minimum of four visual check points (start point, two turn points, and an end point)
  — Turns greater than 30 degrees between legs
  — Visual navigation references (start point can also be identified by NAVAID)
__ Course Control Concepts

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Normal Takeoff and Climb
__ Radio Communications
__ Course Intercept to Navigation Route Start Point
__ Visual Navigation Route
__ Instrument Approach and Landing (if available)
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with navigating a simple visual course using drift corrected headings to maintain course.

Additional Guidance — Proper flight planning preparation is the key for this and the next three lessons. The student should plan the flight by drawing a three-leg course as shown in Attachment 1. If practical, utilize navigation aids to determine the start point of the visual navigation route. Flight over the visual navigation route at minimum safe altitude is preferred. However, fly the route at an altitude commensurate with the Federal Aviation Regulations (FARs), environmental conditions and the CFI's comfort level. Concentrate the instruction on the effects of wind on course control utilizing ETA adjustments for position awareness. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 3 — Navigation

Lesson 11

Dual — Local (1.8)

Objective — The student practices concepts of wind triangle (wind effects on ground speed and ETA), and practice pilotage and dead reckoning through a predetermined visual navigation route.

Preflight Discussion

Lesson Review

__ National Airspace System
__ Flight Publications
__ Sectional Charts
__ Visual Navigation Route Selection
  — Minimum of four visual check points (start point, two turn points, and an end point)
  — Turns greater than 30 degrees between legs
  — Visual navigation references (start point can also be identified by NAVAID)
__ Fuel Requirements
__ Performance and Limitations
__ VFR/IFR Radio Communications
__ Navigation Log
__ Course Control Concepts

Lesson Introduction

__ Wind Effects on Groundspeed
__ Airspeed to Groundspeed conversion
__ ETA Calculations and Updates

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Normal Takeoff and Climb
__ Radio Communications
__ Course Intercept to Navigation Route Start Point
__ Visual Navigation Route
__ Instrument Approach and Landing (if available)
__ After Landing Procedures
__ Parking and Securing

Completion Standards — The student is familiar with calculating ETAs, updating ETAs inflight based on actual groundspeed and Actual Time of Arrival (ATA) while navigating a simple visual navigation course.

Additional Guidance — This lesson should be accomplished similar to Lesson 10. However, this lesson emphasizes the effects of wind on groundspeed and ultimately ETAs as well as course control. The use of enroute check points in addition to the planned turn points helps the student determine early or late from planned time. It is not the intention of the lesson objective to arrive at the end point or turn points on the preflight time but rather to be cognizant of how early or late the aircraft is from preflight time. The student should identify how early or late they are and apply the difference to the ETA for the next turn point. Additionally, it is not necessary to vary the speed of the aircraft to keep up with preflight time. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed.

Stage 3 — Navigation

Lesson 12

Dual — Cross-Country (2.5)

Objective — The student is exposed to a flight profile which includes a simple visual navigation route, an instrument approach to an airport approximately 100 NM from departure airport*, an instrument departure (if available), Victor Airway navigation back to departure airport, approach and land at departure airport.

Preflight Discussion

Lesson Review

__ Flight Publications
__ Sectional Charts
__ Route selection
__ Fuel Requirements
__ Performance and Limitations
__ VFR/IFR Radio Communications
__ Navigation Log
__ Visual Navigation Route Selection
  — Minimum of four visual check points (start point, two turn points, and an end point)
  — Turns greater than 30 degrees between legs
  — Visual navigation references (start point can also be identified by NAVAID)
__ Course Control Concepts
__ Wind Effects on Groundspeed
__ Airspeed to Groundspeed conversion
__ ETA Calculations and Updates

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Normal Takeoff and Climb
__ Opening Flight Plan
__ Radio Communications
__ Course Intercept to Navigation Route Start Point
__ Visual Navigation Route
__ Instrument Approach at an Airport Greater Than 100 NM from Departure Airport
__ Instrument Departure (if available)
__ Victor Airway Route (if available) Back to Departure Airport
__ Normal Approach and Landing
__ After Landing Procedures
__ Closing Flight Plan
__ Parking and Securing

Completion Standards — The student is familiar with entry to and navigation through a simple visual navigation route, instrument approach, instrument departure, and Victor Airway navigation.

Additional Guidance — This lesson combines all of the objectives from earlier lessons. The student prepares a flight plan and draws a visual navigation route toward an airport with an instrument approach (if available). The profile should continue with an instrument approach to that outlying airport followed by Victor Airway navigation back to the departure airport. If desired the flight can stop at the outlying airport prior to the return leg. Use two flight plans, VFR for the outbound leg and IFR for the return leg. Encourage the student to make all radio/communications calls transmitted outside the aircraft. The CFI should assist only as needed and make specific written comments for deficiencies.

* Emphasis flying to an airport with an instrument approach far enough away from the departure airport to allow for approximately one hour of Victor Airway flight back to the departure airport. If necessary, the routing can be indirect to allow adequate practice. If Victor Airways are not available, a predetermined, defined course can be used.

Stage 3 — Navigation

Lesson 13

Dual — Cross-Country (2.5)

Objective — The student practices the flight objective stated in Lesson 12.

Preflight Discussion

Lesson Review

__ Flight Publications
__ Sectional Charts
__ Route selection
__ Fuel Requirements
__ Performance and Limitations
__ VFR/IFR Radio communications
__ Navigation Log
__ Visual Navigation Route Selection
  — Minimum of four visual check points (start point, two turn points, and an end point)
  — Turns greater than 30 degrees between legs
  — Visual navigation references (start point can also be identified by Defined)
__ Course Control Concepts
__ Wind Effects on Groundspeed
__ Airspeed to Groundspeed conversion
__ ETA Calculations and Updates

Flight

__ Engine Start
__ Taxiing Procedures
__ Before Takeoff Check
__ Normal Takeoff and Climb
__ Opening Flight Plan
__ Radio Communications
__ Course Intercept to Navigation Route Start Point
__ Visual Navigation Route
__ Instrument Approach at an Airport Greater Than 100 NM from Departure Airport
__ Instrument Departure (if available)
__ Victor Airway Route (if available) Back to Departure Airport
__ Normal Approach and Landing
__ After Landing Procedures
__ Closing Flight Plan
__ Parking and Securing

Completion Standards — Refer to Lesson 12.

Additional Guidance — Refer to Lesson 12.

Chapter 5

Bibliography

1. **Private Pilot Kit (may include)**
    a. Private Pilot Manual
    b. Maneuvers Book
    c. Private Pilot FAA Airman Knowledge Study Guide and Question Bank
    d. Private Pilot FAA Practical Test Study Guide
    e. E-6B Computer
    f. Plotter
    g. FAR/AIM Book
    h. Logbook

2. **Other Items (as required)**
    a. Headset
    b. Sectional Charts
    c. Instrument Approach Procedures Book
    d. Ground School Videos/CD ROM Course (if not enrolled in formal classroom environment)

3. **Forms Prescribed**
    a. AETC Form 6, Waiver Request
    b. AETC Form 33, NIFT Gradesheet

Attachment 1

The example below shows one way to plan a visual navigation route. This could be an example of a Lesson 10 or 11 flight from Stinson Airport south of San Antonio in a Cessna 172. The student and instructor have chosen to fly the route at minimum safe altitude (between 500 AGL and 1,500 AGL) so the points can be small and defined. If a route is to be flown at higher altitudes, larger, more identifiable turn points and checkpoints should be selected. Use a planned groundspeed comfortable for the training aircraft without wind effects. In this case the groundspeed is 90 knots.

The flight is planned to depart VFR from Stinson and fly to the south point of Mitchell lake (pt A); then to the town of Devine (pt B); then to the town of Charlotte (pt C); and then finish at a 969-foot AGL tower (pt D) before returning to Stinson. Each point is labeled and a “dog house” is drawn to give reference information. In this example, the “dog house” gives magnetic course to the next turn point, planned time of arrival (PTA) in elapsed time, and a navigation aid radial and DME for filing and/or position awareness.

Between each turn point there are one or two checkpoints selected. Annotate the checkpoints with the PTA to the nearest tenth of a minute (6 seconds). These check points can provide course information, time information, or both. For example, the tower on centerline at 8 minutes and 00 seconds between pt A and pt B can give both timing and course information. However, the power line crossing at 23 minutes and 18 seconds between pt B and pt C only gives timing information. If the checkpoint is off centerline, then measure and annotate the miles off (e.g. the edge of the town of Poteet at 37 minutes and 00 seconds between pt C and pt D is 1½ nautical miles right).